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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/087,483	03/01/2002	Mark N. Robins	10011711-1	3023

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HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER

DUONG, THOI V

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 03/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/087,483

Applicant(s)

ROBINS ET AL.

Examiner

Thoi V Duong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 26-49 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 26-49 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 0302.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the Amendment filed December 18, 2003.

Accordingly, claims 1-25 were cancelled, and new claims 26-49 were added.

Currently, claims 26-49 are pending in this application.

Response to Arguments

2. Applicant's arguments with respect to claims 26-49 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 26, 27, 31-34 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Popovich et al. (USPN 6,687,030) in view of Taniguchi et al. (USPN 6,445,406).**

As shown in Figs. 2 and 11, Popovich et al. discloses a diffractive focusing device 208 for focusing light from a subject onto a focal plane 114 located a distance D from said device, comprising:

a light transmissive substrate 1102; and

a plurality of selectively light opaque elements 1106 supported by said light transmissive substrate and being selectively controlled to be either substantially light opaque or substantially light transmissive (col. 11, lines 31-61),

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wherein said plurality of selectively light opaque elements being controlled to form a focusing diffraction grating pattern of light transmissive channels (see Fig. 1);

As shown in Fig. 18, the device of Popovich et al. further comprises in combination a corrective diffractive device 1804 positioned substantially coaxially with a diffractive focusing device 1200 (see also Fig. 12 and col. 12, lines 23-35), said corrective diffractive device comprising a light transmissive substrate, a plurality of selectively light opaque elements supported by said light transmissive substrate and being selectively controlled to be either substantially light opaque or substantially light transmissive (col. 15, lines 28-35). The diffractive focusing device comprises a stack of 3 optical elements for diffracting the output lights 204R, 204G and 204B and the corrective diffractive device is designed to act on red, green, and blue bandwidth light. Accordingly, it is obvious that a spacing between successive light transmissive channels of the corrective diffractive device is different from the spacing of said focusing diffraction grating pattern.

Re claims 27 and 34, Popovich et al. discloses that the plurality of selectively light opaque elements are comprised of liquid crystal material (col. 11, lines 53-58).

Re claims 31 and 38, the selectively light opaque elements 1106 are formed on said substrate 1102 as shown in Fig. 11.

Re claims 26 and 32, Popovich et al. discloses a diffractive device that is basically the same as that recited in claims 26 and 32 except for light transmissive channels separated by light opaque regions, wherein a variable spacing between successive light transmissive channels varies as a function of D.

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As shown in Figs. 1A and 20, Taniguchi et al. discloses a diffractive device 6 comprising light transmissive channels R,L (as 502 in Fig. 1A) separated by light opaque regions (as 503 in Fig. 1A) (col. 1, lines 36-48), wherein, according to formula 4 in col. 18, a variable spacing V_d between successive light transmissive channels varies as a function of a distance L from a subject 6 to a focal plane (as an observer).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the diffractive device of Popovich et al. with the teaching of Taniguchi et al. by forming successive light transmissive channels such that a variable spacing between those channels varies as a function of a distance D so as to obtain a satisfactory stereoscopic image (col. 2, line 66 through col. 3, line 5).

5. Claims 28, 29, 35 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Popovich et al. (USPN 6,687,030) in view of Taniguchi et al. (USPN 6,445,406) as applied to claims 26, 27, 31-34 and 38 above and further in view of Oda et al. (USPN 6,476,550 B1).

The diffractive focusing device of Popovich et al. as modified in view of Taniguchi et al. above includes all that is recited in claim 28 except for said focusing diffraction grating pattern formed as a concentric plurality of light transmissive rings. As shown in Fig. 6, Oda et al. discloses a diffraction grating made by forming a transparent electrode as grooves in concentric pattern to enhance the light output efficiency (col. 5, lines 15-20 and col. 5, line 59 through col. 6, line 6).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the device of Popovich et al. with the

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teaching of Oda et al. by forming the diffraction grating pattern as a concentric plurality of light transmissive rings to enhance the light output efficiency (col. 5, line 59 through col. 6, line 6).

Finally, re claims 29 and 36, as to the product-by-process limitation "wherein a spacing Delta between successive light transmissive channels of said focusing device is determined by the following equation $\Delta = \dots$ ", it has been recognized that "Even through product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior art product was made by a different process". *In re Thorpe*, 227 USPQ 964,966 (Fed. Cir. 1985). See also MPEP 2113.

6. Claims 30 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Popovich et al. (USPN 6,687,030) in view of Taniguchi et al. (USPN 6,445,406) as applied to claims 26, 27, 31-34 and 38 above and further in view of Jepsen et al. (USPN 6,172,792 B1).

The diffractive focusing device of Popovich et al. as modified in view of Taniguchi et al. above includes all that is recited in claim 30 except for said plurality of selectively light opaque elements formed in said substrate so as to be substantially flush with an exterior surface of said substrate. As shown in Fig. 3A and 3B, Jepsen et al. discloses a light modulation device comprising a substrate 105, an insulating wall 115 formed as a part of the substrate, and a cavity 125 containing liquid crystal 130 as light opaque

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material; accordingly, the liquid crystal 130 is flush with the top of the insulating wall 115 as an exterior surface of the substrate.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the device of Popovich et al. with the teaching of Jepsen et al. by forming plurality of selectively light opaque elements substantially flush with an exterior surface of a substrate so as to create and modulate highly efficient diffraction gratings (col. 3, lines 19-22).

7. Claims 39-44, 48 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Popovich et al. (USPN 6,687,030) in view of Taniguchi et al. (USPN 6,445,406) as applied to claims 26, 27, 31-34 and 38 above and further in view of Rostoker et al. (USPN 5,340,978).

Re claims 44 and 48, Popovich et al. discloses that the plurality of selectively light opaque elements are comprised of liquid crystal material (col. 11, lines 53-58), and the selectively light opaque elements 1106 are formed on said substrate 1102 as shown in Fig. 11.

Re claim 49, as shown in Fig. 18, the device of Popovich et al. further comprises in combination a corrective diffractive device 1804 positioned substantially coaxially with a diffractive focusing device 1200 (see also Fig. 12 and col. 12, lines 23-35), said corrective diffractive device comprising a light transmissive substrate, a plurality of selectively light opaque elements supported by said light transmissive substrate and being selectively controlled to be either substantially light opaque or substantially light transmissive (col. 15, lines 28-35). The diffractive focusing device comprises a stack of

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3 optical elements for diffracting the output lights 204R, 204G and 204B and the corrective diffractive device is designed to act on red, green, and blue bandwidth light. Accordingly, it is obvious that a spacing between successive light transmissive channels of the corrective diffractive device is different from the spacing of said focusing diffraction grating pattern.

The diffractive focusing device of Popovich et al. as modified in view of Taniguchi et al. above includes all that is recited in claims 39-44, 46, 48 and 49 except for an image sensor.

Re claims 39 and 40, as shown in Fig. 13, Rostoker et al. discloses an image capturing apparatus 1300 comprising an image sensor 1310, a diffractive focusing device 1340, and a shutter 1380 between said diffractive focusing device and said image sensor (col. 12, lines 33-68).

Re claims 41-43, Fig. 1 of Rostoker et al. shows a solid state image sensor 100 comprising an array of light sensitive element 102 or a CCD array, and a photographic film 106 (col. 5, lines 13-20 and 58-62).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the device of Popovich et al. with the teaching of Rostoker et al. by employing an image sensor for providing a complete representation of the incident image (col. 2, lines 24-27).

8. Claims 45 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Popovich et al. (USPN 6,687,030) in view of Taniguchi et al. (USPN 6,445,406)

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and Rostoker et al. (USPN 5,340,978) as applied to claims 39-44, 48 and 49 above and further in view of Oda et al. (USPN 6,476,550 B1)

The diffractive focusing device of Popovich et al. as modified in view of Taniguchi et al. and Rostoker et al. above includes all that is recited in claim 45 except for said focusing diffraction grating pattern formed as a concentric plurality of light transmissive rings. As shown in Fig. 6, Oda et al. discloses a diffraction grating made by forming a transparent electrode as grooves in concentric pattern to enhance the light output efficiency (col. 5, lines 15-20 and col. 5, line 59 through col. 6, line 6).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the device of Popovich et al. with the teaching of Oda et al. by forming the diffraction grating pattern as a concentric plurality of light transmissive rings to enhance the light output efficiency (col. 5, line 59 through col. 6, line 6).

Finally, re claim 46, as to the product-by-process limitation "wherein a spacing Delta between successive light transmissive channels of said focusing device is determined by the following equation $\Delta = \dots$ ", it has been recognized that "Even through product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior art product was made by a different process". *In re Thorpe*, 227 USPQ 964,966 (Fed. Cir. 1985). See also MPEP 2113.

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9. Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Popovich et al. (USPN 6,687,030) in view of Taniguchi et al. (USPN 6,445,406) and Rostoker et al. (USPN 5,340,978) as applied to claims 39-44, 48 and 49 above and further in view of Jepsen et al. (USPN 6,172,792 B1).

The diffractive focusing device of Popovich et al. as modified in view of Taniguchi et al. and Rostoker et al. above includes all that is recited in claim 47 except for said plurality of selectively light opaque elements formed in said substrate so as to be substantially flush with an exterior surface of said substrate. As shown in Fig. 3A and 3B, Jepsen et al. discloses a light modulation device comprising a substrate 105, an insulating wall 115 formed as a part of the substrate, and a cavity 125 containing liquid crystal 130 as light opaque material; accordingly, the liquid crystal 130 is flush with the top of the insulating wall 115 as an exterior surface of the substrate.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the device of Popovich et al. with the teaching of Jepsen et al. by forming plurality of selectively light opaque elements substantially flush with an exterior surface of a substrate so as to create and modulate highly efficient diffraction gratings (col. 3, lines 19-22).

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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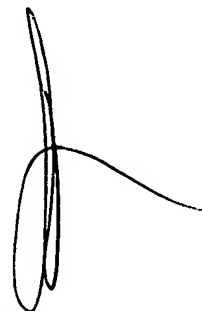
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (571) 272-2292. The examiner can normally be reached on Monday-Friday from 8:30 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached at (571) 272-2293.

Thoi Duong 

03/08/2004



**KENNETH PARKER
PRIMARY EXAMINER**